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A Duoterminal Flexible Electrode

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ELECTROCOAGULATION OF TURBINATES —

A Duoterminal Flexible Electrode *

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In a previous paper(1) I mentioned the use of a semi-rigid, flexible, duoterminal electrode in surgical diathermy within the nasal cavity. Although I have used the electrode since 1926, it is only recently, through the cooperation of the General Electric X-Ray Corporation that it has reached its present state of development. Then, too, although clinical end results in over fifty cases of turbinate coagulation have been especially gratifying, I have deemed it advisable to establish histologically the ultimate repair of the coagulated turbinate epithelium. Sections taken from patients three and six months after coagulation show regeneration of the epithelium.

The electrode (Fig. 1) consists of a special insulation enclosing two wires which connect at one end with two narrow silver plates serving as the active terminals; at the other end, with a double cord for attachment to the two poles of a diathermy unit. Its diameter is so small that it allows not only of easy insertion into the nose but also of direct vision for accurate application of the active silver terminals to the area treated. It can be bent to any curve or angle so that the hand does not obstruct vision (Fig. 2), and yet it is rigid enough so that the silver terminals can be pressed against the treated area and away from the adjoining tissue. The silver terminals with their flat surfaces in parallel planes can be bent, approximated or separated and applied simply on edge, or they can be sprung to straddle the tissue under treatment (Fig. 3). The flat sides of the terminals have

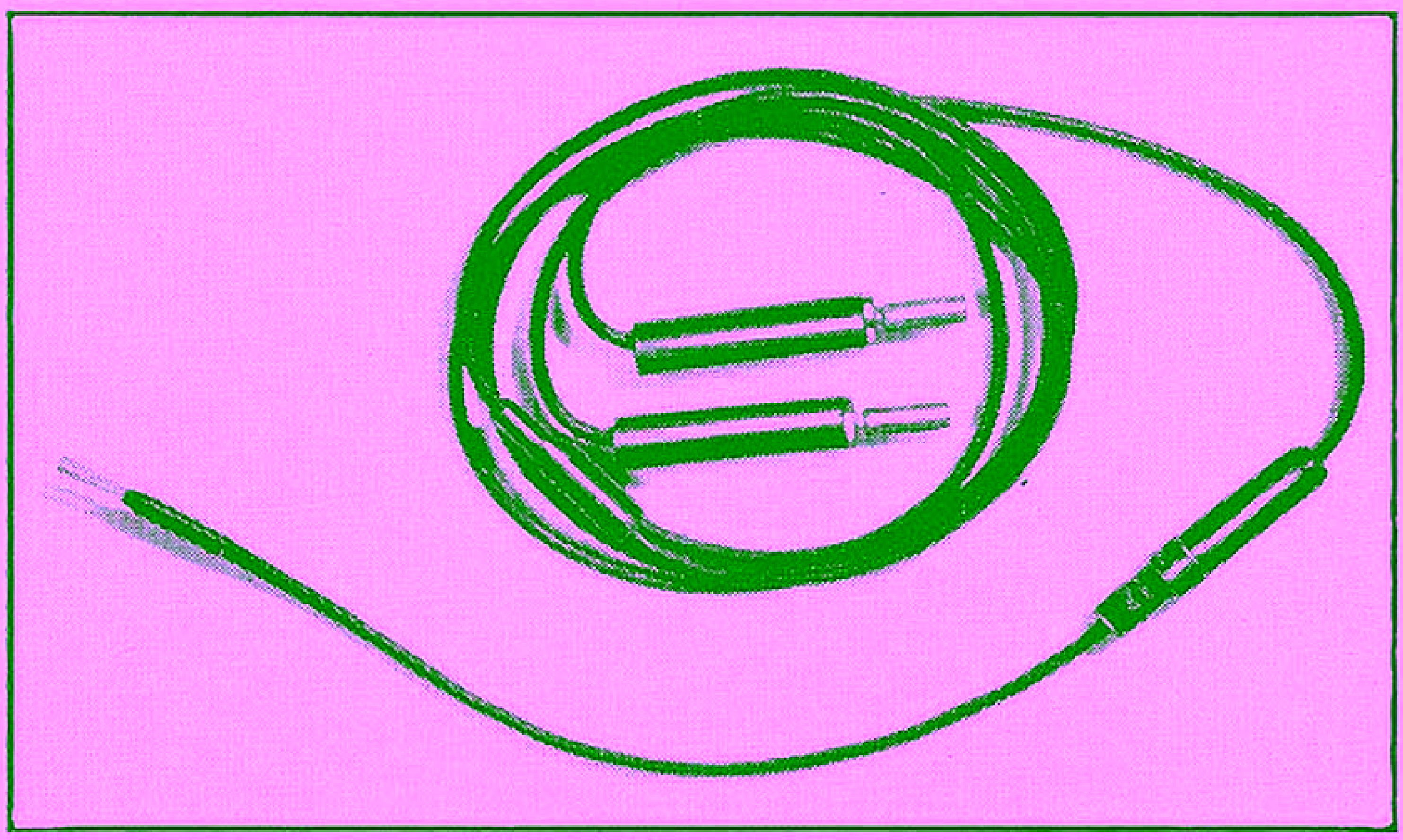

Fig. 1. Flexible duoterminal electrode.

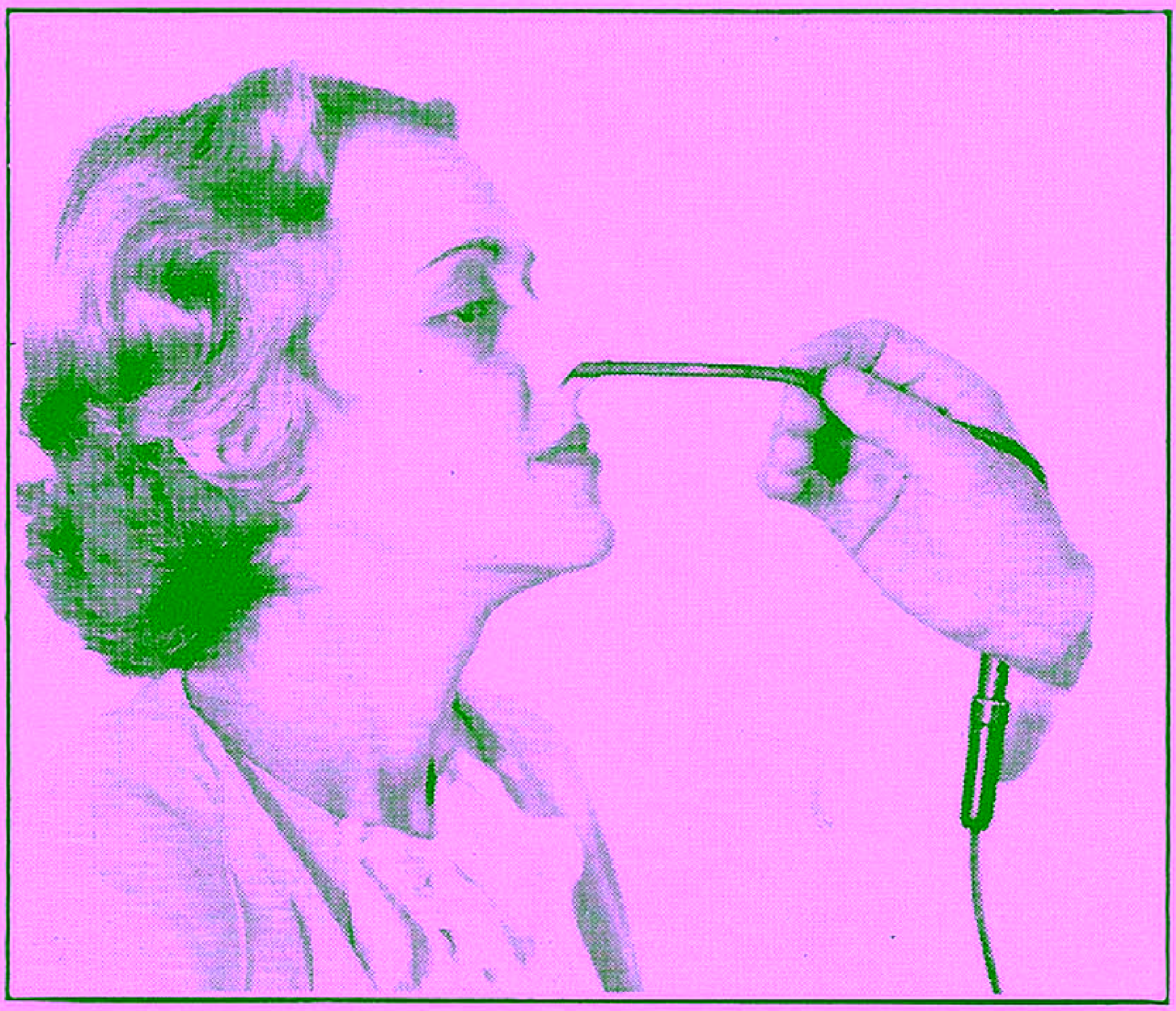

Fig. 2. Demonstrates flexibility of duoterminal electrode.

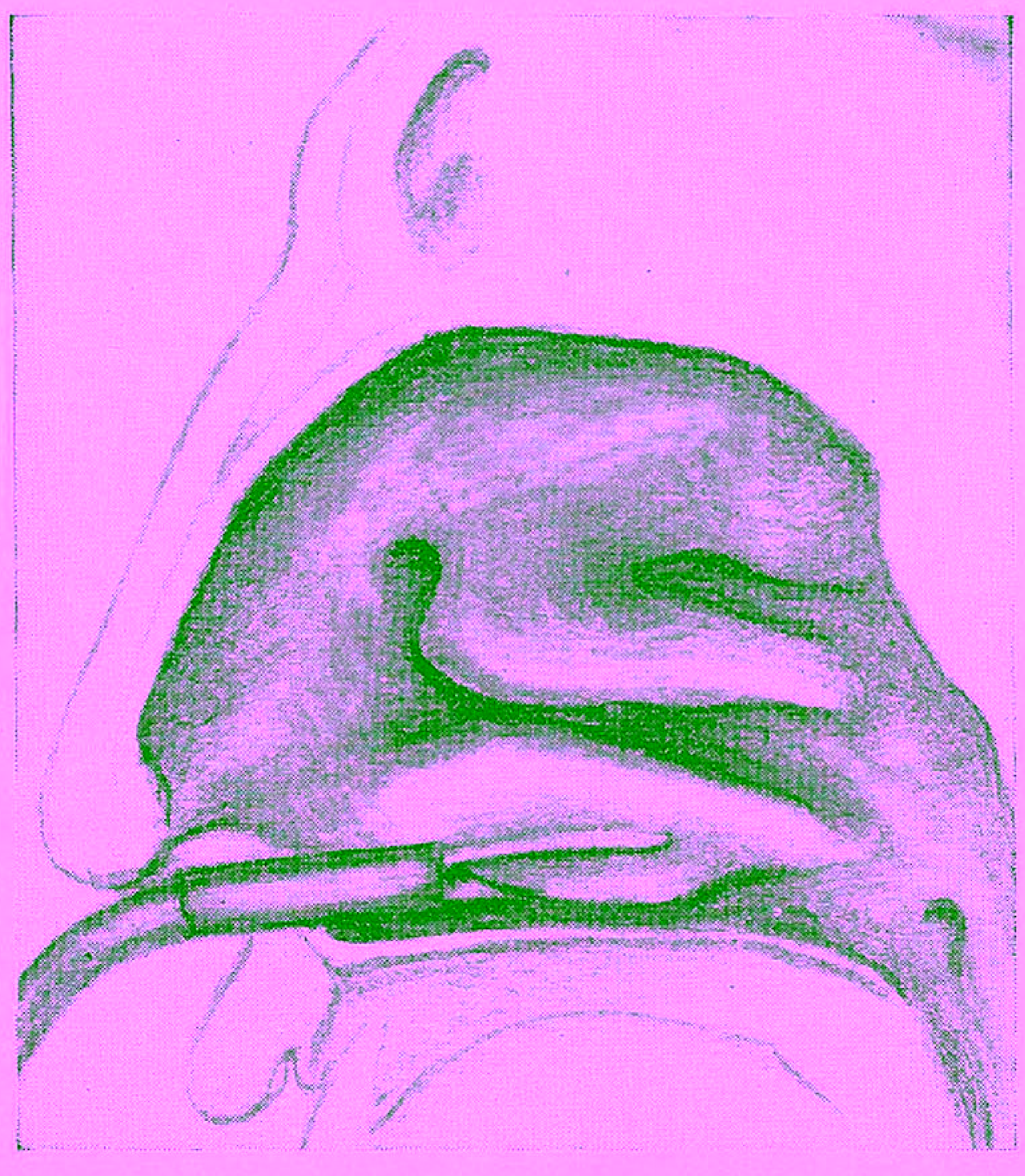

Fig. 3. Electrode can be separated to straddle the turbinate or other tissues.

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enough surface area so that with the use of a proper weaker current, diathermy of the turbinate is possible without coagulation as suggested by Sinskey(3) and Gross(4). Boiled or simply immersed in solutions such as metaphen or merthiolate it retains a smooth clean surface. Because it is duoterminal there is, of course, no need for applying an indifferent electrode to the patient, or for the use of an auto-condensation cushion. Experience with this electrode suggests the following advantages in the electrocoagulation of turbinates:

1. The absence of bleeding permits direct vision throughout the procedure.

2. Under topical anesthesia coagulation is entirely painless. If carefully applied much of the anesthetic is probably held in the coagulum; therefore, unabsorbable and harmless. The use of cocaine is not necessary since synthetic anesthetics are safer and very efficient. A formula prepared for me by the Abbott Laboratories has proved especially effective, viz.:

Butesin (para-amino-benzoyl-butanol)	25 per cent
Ephedrine	1 per cent
Carbitol (diethylene-glycol-mene-ethyl-ether)	q. suf.

This solution must not be injected. Topically applied, it is rapid and affords an anesthesia of at least six hours duration without the disagreeable effect and irritation of cocaine.

3. The absence of pain eliminates any reluctance on the part of the patient towards a second or even third treatment if necessary and, therefore, there is no reason for over-coagulation or undue destruction at any single sitting. Undue destruction is far more detrimental to the welfare of the patient than the loss through electrocoagulation of a portion of epithelium. For, as Hilding(5) has definitely shown over-aeration itself can result in a change of the normal epithelium of the nose, whether cuboidal, columnar or ciliated, to a relatively physiologically inert stratified epithelium. He furthermore stresses the remarkable regenerative power of this respiratory epithelium. Electrocoagulation subjects the patient to minimal discomfort and tissue destruction and offers to the operator a precise method for a two or three stage treatment as indicated. Far from causing a serious loss of epithelium the minimal removal of an obstructive hypertrophy on one side may result in a beneficial change in the impaired epithelium of the previously over-aerated opposite side.

4. In cases with obstruction or with distressing headaches due to pressure of a middle turbinate on the septum as described by Grain,(6) relief is frequently immediate and very striking.

5. There is no need for any pre- or postoperative application of an antiseptic. This, in itself, is a distinct advantage over the usual surgical procedure when one considers the extreme value of the intact mucin film(7) covering an epithelium especially susceptible to even hypotonic solutions(8) and irritants.(9)

6. The nasal discharge following coagulation is negligible.

7. The patient need lose no time from routine work and needs no hospitalization.

8. In no case was there any evidence of reaction afterward such as coryza or purulent discharge due to infection. At times a congestion of the conjunctiva occurs on the same side, almost immediately or soon after treatment, but this quite rapidly and entirely recedes.

9. After the eighth or tenth day any dry coagulum can be removed with forceps to facilitate more rapid healing. There has never occurred any evidence of crust formation or dryness in cases after even a five year interval. The entire absence of constricting scar formation following coagulation with the diathermy current markedly differentiates it from the now discarded method of active cauterization.

10. A succeeding coagulation where necessary can be done before healing is complete provided care is taken to avoid bleeding and resulting obstruction to direct vision in applying anesthetic.

11. Medical diathermy of the enlarged turbinate in my experience has proved tedious and prolonged. It seems rather unnecessary to affect the bulk of the turbinate whether through medical diathermy, galvanism or by insertion of an electrode into the body of the turbinate. Since under electrocoagulation the redundant portion only should be precisely re-

moved, the area denuded of epithelium is relatively very small as compared to the normal amount over the conchae and meatuses. The loss of this epithelium seems negligible in clinical observation of patients after a five year interim. Histologically, the epithelium and glands probably regenerate as rapidly after electrocoagulation as after any surgical procedure.

12. Because one of the objects of electrocoagulation is the elimination of discomfort and loss of occupational time on the part of the patient, it is advisable to treat a single side at each sitting.

13. Obviously, knowledge of the indications for coagulation is essential. An osseous hypertrophy of the turbinates, because of slow sequestration and prolonged discharge, and so also certain polypi,(10) since very often they are indicative of sinus infection, are scarcely amenable to, or permanently removed by electrocoagulation.

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References

1. Jaros, Joseph F.: Electrocoagulation of Tonsils — A Biterminal Flexible Electrode. *Arch. Phys. Ther., X-Ray, Rad.,* **13**:683, (Nov.) 1932.

2. Jaros, Joseph F.; Thometz, Harry M., and Rukstinat, George J.: In preparation.

3. Sinskey, Samuel J.: Turbinate Shrinkage by High Frequency. *A. J. Phys. Ther.,* **9**:94, (July) 1932.

4. Gross, William, A.: Conservatism in Nasal Surg. as Applied to the Nasal Mucosa. *A. J. Phys. Ther.,* **9**:199, (Nov.) 1932.

5. Hilding, Anderson: *Arch. Otolaryn.,* **16**, 1932.

6. Grain: *Revue de Medicin Paris,* **46**:217, 1929.

7. Hilding, Anderson: *Annals of Inter. Med.,* **6**:227, 1933.

8. Stark, W. B.: *Arch. Otolaryn.,* **8**:47, 1924.

9. Fox, Nash: *Arch. Otolaryn.,* **13**:73, 1929.

10. Crowe, Samuel J.: *Lewis' Practice of Surgery.* Baltimore, W. F. Prior Company, IV, Chap. 3, pp. 15.

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